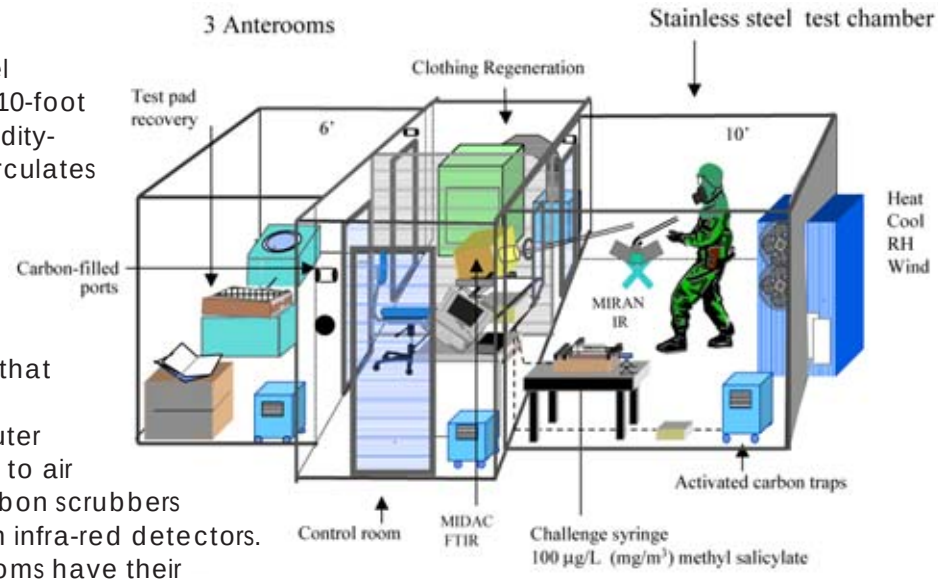
2-Person Chamber for MOPP Ensemble Man in Simulant Test (MIST)

What It Is:

A **Man-in-Simulant Test (MIST) Chamber** has been constructed at the Natick Soldier Center to measure vapor leak through chemical protective clothing ensembles. The chamber uses common approved chemical agent simulants that are recaptured after use to evaluate the protection factor associated with chemical protective clothing. The 2-man chamber provides two-hour MIST testing of new ensemble designs to identify protection issues during the research and development phase of these items. This testing is particularly valuable in assessing mask, glove, boot and garment interfaces as well as screening potential closure systems of any chemical protective item during prototyping. On-site testing will reduce development time and cost, reduce the amount of agent simulant required by larger alternative facilities and provide an immediate feedback mechanism for evaluating new ensembles and closure technologies.

Description:

The 2-man stainless steel chamber is a 9-foot by 10-foot temperature- and humidity-controlled room that circulates air within the chamber. Simulant vapor is produced by computer controlled automated syringe application of droplets that evaporate. Vapor concentration is computer regulated by feedback to air cleaning activated carbon scrubbers actuated by signal from infra-red detectors. Three attached anterooms have their connecting ports filled with activated carbon to prevent environmental contamination during test, post-test doffing and the collection of detector strips from the body. The chamber is cleaned with filtered air at 150° F.



Ancillary components:

- Vapor monitors (2): MIRAN IR, MIDAC industrial FTIR calibrated to methyl salicylate.
- Prior to human testing mannikins that mimic an active soldier in stretching the uniform are used: the arms and legs of a p-urethane coated store mannikin are manipulated with motorized pulleys, and an automatronic mannikin's computer-controlled bending and reaching motions are actuated by compressed air hydraulics.
- Chemical protection factor of the body is found after the two hour test by assay of the simulant chemical that has been sorbed by standard detector patches worn on the skin (Natick style Tenax), using Thermal Desorption GC.

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